# UNITED STATES PATENT AND TRADEMARK OFFICE

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/633,135 | 07/31/2003 | James A. Mitchell | ITL.1003US (P16575) | 3092 |

| 21906          7590          04/18/2007 | EXAMINER |
|---|---|
| TROP PRUNER & HU, PC<br>1616 S. VOSS ROAD, SUITE 750<br>HOUSTON, TX 77057-2631 | WANG, TED M |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2611 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|---|---|---|
| 3 MONTHS | 04/18/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | **Application No.** | **Applicant(s)** |
|---|---|---|
| **Office Action Summary** | 10/633,135 | MITCHELL ET AL. |
| | **Examiner** | **Art Unit** | |
| | Ted M. Wang | 2611 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *22 January 2007*.

2a)☒ This action is **FINAL.**    2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *8-10,12-18 and 22-25* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8-10,12-18 and 22-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 January 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All    b)☐ Some * c)☐ None of:

    1.☐ Certified copies of the priority documents have been received.

    2.☐ Certified copies of the priority documents have been received in Application No. _____.

    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Arguments*

1.　　Applicant's arguments, filed on 11/2/2004, have been fully considered but they are not persuasive. The Examiner has thoroughly reviewed Applicants' arguments but firmly believes that the cited reference to reasonably and properly meet the claimed limitations.

<u>Independent Claims 8, 14 and 22</u>

(1) *Applicants' argument* – "<u>Thus, the difference is that there is no effort in the cited reference to hold the data packets until each of the buffers has a predetermined depth. Instead, the reference simply uses a time out function on the deskewing, the time out determined by when a buffer reaches some predetermined maximum size and this is used as an indication that deskewing will not be possible.</u> " as recited.

*Examiner's response –*

　　　　Column 7, line 60 – column 8, line 1 of the Vila's reference teaches that while the buffer is in the ALIGNED state, it accumulates data and the buffer remains in the ALIGNED state until ***either all of the buffers are in the ALIGNED state*** or the number of data symbols stored in the buffer reaches a predetermined maximum number.

　　　　Column 8, lines 9-16, Vila further teaches ***when all of the buffers reach the ALIGNED state (and none of the buffers has reached its maximum***

***threshold,) the buffers are all transitioned to the DESKEWED state.*** When

the buffers are in the DESKEWED state, the data symbols which have been

stored in the buffers are read out.

With the teaching of the above paragraphs, Vila clearly teaches <u>holding</u>

<u>the data packets (during the ALIGNED state) until each of the buffers has a</u>

<u>predetermined depth (when all of the buffers reach the ALIGNED state without</u>

<u>reaching its maximum threshold). Where the predetermined depth is the number</u>

<u>of the data symbols stored in the buffer that smaller than that of the</u>

<u>predetermined maximum number.</u> Thus, for the explanation addressed in the

above paragraph, the rejection under 35 U.S.C. 102(e) with Vila's reference is

adequate.

### *Claim Rejections - 35 USC § 102*

2.      The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by
another filed in the United States before the invention by the applicant for patent or (2) a patent
granted on an application for patent by another filed in the United States before the invention by the
applicant for patent, except that an international application filed under the treaty defined in section
351(a) shall have the effects for purposes of this subsection of an application filed in the United States
only if the international application designated the United States and was published under Article 21(2)
of such treaty in the English language.

3.      Claims 8-10, 12-16 and 18 are rejected under 35 U.S.C. 102(e) as being

anticipated by Vila et al. (US 6,654,824).

❑   With regard claim 8, Vila et al. discloses a method comprising:

receiving data packets (streams) (Fig.3 and 4 elements 34a-34d, and

column 4 line 61 –column 5 line 11) on a plurality of channels of a receiver (Fig.2

elements 24, 22, 23a-23d, column 4 lines 30-44);

detecting whether the data packets (streams) are misaligned while the

data packets (streams) are maintained in buffer corresponding to the plurality of

channels (column 2 lines 34-38 and 45-58 and column 8 lines 34-55); and

aligning the data packets (streams) if the data packets (streams) are

misaligned (column 2 lines 58-65 and column 8 lines 56-67); and

holding the data packets until each of the buffers has a predefined depth

(column 7 line 50 – column 8 line 16).

Column 7, line 60 – column 8, line 1 of the Vila's reference teaches that

while the buffer is in the ALIGNED state, it accumulates data and the buffer

remains in the ALIGNED state until ***either all of the buffers are in the***

***ALIGNED state*** or the number of data symbols stored in the buffer reaches a

predetermined maximum number.

Column 8, lines 9-16, Vila further teaches ***when all of the buffers reach***

***the ALIGNED state (and none of the buffers has reached its maximum***

***threshold,) the buffers are all transitioned to the DESKEWED state.*** When

the buffers are in the DESKEWED state, the data symbols which have been

stored in the buffers are read out.

With the teaching of the above paragraphs, Vila clearly teaches holding

the data packets (during the ALIGNED state) until each of the buffers has a

predetermined depth (when all of the buffers reach the ALIGNED state without

reaching its maximum threshold). Where the predetermined depth is the number

of the data symbols stored in the buffer that smaller than that of the

predetermined maximum number.

Where the "packet" is defined as "a short fixed length section of data that

is transmitted as a unit in an electronic communications network" by Merriam –

Webster's collegiate Dictionary, 10th edition, 2000. Vila et al. teaches the data

streams could be bytes, words or frames (column 4 lines 53-56). It is inherent

that the data symbols "0" – '7" (Fig.3) and data symbols "0" – "15", individually,

can be considered as a packet since each of data symbol ("0"m-"15") has fixed-

length section (byte or word or frame) as addressed in the above paragraph.

❏ With regard claim 9, Vila et al. further discloses wherein determining whether the

data packets are misaligned comprises analyzing whether a predetermined value

is received on each of the plurality of channels (Fig.8, T0-T3, and column 7 lines

1-2) within a first time period (column 2 lines 34-35 and column 4 lines 19-21 and

column 7 lines 39-44, where examiner considers the first time period as the time

period from a particular buffer being reset to the test sequence received in the

particular buffer).

❏ With regard claim 10, Vila et al. further discloses the data packets in an aligned

manner (column 8 lines 34-55).

❏ With regard claim 12, Vila et al. further discloses realigning the data packets if

the data packets become misaligned (column 8 lines 56-67).

❑ With regard claim 13, Vila et al. further discloses wherein the data packets are

byte striped (column 4 lines 53-56 and column 7 lines 12-14).

❑ With regard claim 14, Vila et al. discloses

buffers to store data packets from a plurality of channels (column 2 lines

45-55, Fig.2 and Fig.4 and column 7 lines 50-59); and

a state machine (Fig.10) coupled to the buffers to deskew the data

packets while the data packets are stored in the buffers (column 7 line 60 –

column 8 line 19); and

to hold the data packets until each of the buffers has a predefined depth

(column 7 line 50 – column 8 line 16).

Column 7, line 60 – column 8, line 1 of the Vila's reference teaches that

while the buffer is in the ALIGNED state, it accumulates data and the buffer

remains in the ALIGNED state until **_either all of the buffers are in the_**

**_ALIGNED state_** or the number of data symbols stored in the buffer reaches a

predetermined maximum number.

Column 8, lines 9-16, Vila further teaches **_when all of the buffers reach_**

**_the ALIGNED state (and none of the buffers has reached its maximum_**

**_threshold,) the buffers are all transitioned to the DESKEWED state._** When

the buffers are in the DESKEWED state, the data symbols which have been

stored in the buffers are read out.

With the teaching of the above paragraphs, Vila clearly teaches holding

the data packets (during the ALIGNED state) until each of the buffers has a

predetermined depth (when all of the buffers reach the ALIGNED state without reaching its maximum threshold). Where the predetermined depth is the number of the data symbols stored in the buffer that smaller than that of the predetermined maximum number.

Where the "packet" is defined as "a short fixed length section of data that is transmitted as a unit in an electronic communications network" by Merriam – Webster's collegiate Dictionary, 10th edition, 2000. Vila et al. teaches the data streams could be bytes, words or frames (column 4 lines 53-56). It is inherent that the data symbols "0" – '7" (Fig.3) and data symbols "0" – "15", individually, can be considered as a packet since each of data symbol ("0"m-"15") has fixed-length section (byte or word or frame) as addressed in the above paragraph.

- With regard claim 15, Vila et al. further discloses wherein the state machine is adapted to hold the data packets in the buffers until a predetermined character is present in each of the buffers (Fig.10 and column 7 line 50 – column 8 line 1).

- With regard claim 16, Vila et al. further discloses a counter to count cycles occurring after receipt of a first data packet having the predetermined character (column 2 lines 36-44 and column 4 lines 21-29 and column 7 line 65 – column 8 line 9, where it is inherent to have a counter to count the predetermined maximum number as indicated in the cited paragraphs).

- With regard claim 18, Vila et al. further discloses wherein the data packets comprise InfiniBand data packets (column 4 lines 30-36).

## *Claim Rejections - 35 USC § 103*

4.     The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed
> or described as set forth in section 102 of this title, if the differences between the
> subject matter sought to be patented and the prior art are such that the subject
> matter as a whole would have been obvious at the time the invention was made
> to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was
> made.

5.     Claims 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vila et

al. (US 6,654,824) in view of Deng (US 6,871,301).

- With regard claim 17, Vila et al. discloses all of the subject matter as described in

   the above paragraph except for specifically teaching a plurality of state

   machines, each corresponding to one of the plurality of channels.

   However, Deng teaches a plurality of state machines, each corresponding

   to one of the plurality of channels (Fig.3 element 60, column 3 lines 31-32 and

   column 4 lines 57-65, where the deskew state machine is included in each of the

   switch fabric chips 12a-12d of Fig.2.) in order to align the data streams on all

   chips four chips 12a-d (column 5 lines 1-2) so that the skew introduced between

   lanes can be eliminated.

   Therefore, It would have been obvious to one of ordinary skill in the art at

   the time of the invention was made to include the plurality of state machines as

   taught by Deng, into Vila's individual receiver (Fig.5 elements 56a-56d) so as to

   eliminate the skew introduced between lanes.

6.      Claims 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Mann (US 6,625,675) in view of Vila et al. (US 6,654,824).

&#9633;   With regard claim 22, Mann discloses

            a switch fabric (Fig.1A and 1B element 30 and column 1 lines 12-18 and

38-40);

            a plurality of buffers (Fig.2 element 250 and column 3 lines 18-21) coupled

to the switch fabric to receive data packets (column 2 lines 52-53) from a plurality

of channels.

            Mann discloses all of the subject matter as described in the above

paragraph except for specifically teaching a state machine coupled to the

plurality of buffers to deskew the data packets while the data packets are

received in the plurality of buffers.

            However, Vila et al. teaches a state machine (Fig.10) coupled to

the plurality of buffers to deskew the data packets while the data packets are

received in the plurality of buffers (column 7 line 50 – column 8 line 16) and to

hold the data packets until each of the buffers has a predefined depth (column 7

line 50 – column 8 line 16) in order to align the data streams between lanes so

that the skew introduced between lanes can be eliminated.

Column 7, line 60 – column 8, line 1 of the Vila's reference teaches that while the

buffer is in the ALIGNED state, it accumulates data and the buffer remains in the

ALIGNED state until ***either all of the buffers are in the ALIGNED state*** or the

number of data symbols stored in the buffer reaches a predetermined maximum

number. Column 8, lines 9-16, Vila further teaches ***when all of the buffers***

***reach the ALIGNED state (and none of the buffers has reached its***

***maximum threshold,) the buffers are all transitioned to the DESKEWED***

***state.*** When the buffers are in the DESKEWED state, the data symbols which

have been stored in the buffers are read out.

With the teaching of the above paragraphs, Vila clearly teaches <u>holding</u>

<u>the data packets (during the ALIGNED state) until each of the buffers has a</u>

<u>predetermined depth (when all of the buffers reach the ALIGNED state without</u>

<u>reaching its maximum threshold). Where the predetermined depth is the number</u>

<u>of the data symbols stored in the buffer that smaller than that of the</u>

<u>predetermined maximum number.</u>

Therefore, It would have been obvious to one of ordinary skill in the art at

the time of the invention was made to include the system with a state machine to

deskew the data packet as taught by Vila et al. into Mann's core logic circuitry so

as to eliminate the skew introduced between lanes.

□ With regard claim 23, Mann further discloses a host channel adapter including

the plurality of buffers (Fig.1A element 35 and column 3 lines 45-50).

□ With regard claim 24, Mann further discloses wherein the host channel adapter

further includes a counter to count cycles occurring after receipt of a first data

packet having a predetermined character (Fig.3A and 3B element 275 and

column 4 lines 10-29 and column 5 line 45 – column 6 line 38, where the

predetermined character is the 'comma" symbol (column 5 lines 63-64)).

❑  With regard claim 25, Mann further discloses wherein the switch fabric comprises

an InfiniBand switch fabric (Fig.1A and 1B element 30 and column 1 lines 12-18

and 38-40).

### *Conclusion*

7.      **THIS ACTION IS MADE FINAL.**  Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

8.      A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action.  In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action.  In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

9.      Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Ted M. Wang whose telephone number is 571-272-

3053.  The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Chieh Fan can be reached on 571-272-3042.  The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Ted M Wang
Examiner
Art Unit 2611

Ted M. Wang

DAC HA
PRIMARY EXAMINER